

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-48 (Cancelled)

49. (New) An isolated, non-naturally occurring fibrin binding polypeptide comprising:

a polypeptide comprising a cyclic peptide having the amino acid sequence

Cys-X₂-X₃-Tyr-X₅-X₆-Cys (SEQ ID NO:2), wherein

| _____ |

X₂ is Ala, Glu, Phe, Gly, Ile, Lys, Leu, Met, Arg, Thr, Val, Tyr, Asn, Asp, Gln, His, Ser, or Trp;

X₃ is Ser, Phe, Ala, or Tyr;

X₅ is Gly, Ala or DAla; and

X₆ is Thr, Val or Ser,

wherein said fibrin binding polypeptide has the ability to bind fibrin.

50. (New) The isolated, non-naturally occurring fibrin binding polypeptide according to claim 49, wherein the amino acid residue X₅ is Gly and the amino acid residue X₆ is Thr.

51. (New) The isolated, non-naturally occurring fibrin binding polypeptide according to claim 49, wherein said cyclic peptide comprises the amino acid sequence

X₁-X₂-Cys-X₄-X₅-Tyr-X₇-X₈-Cys-X₁₀-X₁₁ (SEQ ID NO:1), wherein

| _____ |

X₁ is Arg, Asp, His, Leu, or Phe;

X₂ is Ala, Asp, Gly, Pro or Ser;

X₄ is Ala, Glu, Phe, Gly, Ile, Lys, Leu, Met, Arg, Thr, Val, Tyr, Asn, Asp, Gln, His, Ser, or Trp;

X₅ is Ser, Phe, Ala, or Tyr;

X₇ is Gly, Ala or DAla;

X₈ is Thr, Val or Ser;

X₁₀ is His, Leu or Phe; and

X₁₁ is Arg, Asp or His.

52. (New) An isolated, non-naturally occurring fibrin binding polypeptide comprising:
a polypeptide comprising a cyclic peptide having the amino acid sequence
Cys-Tyr-X₃-Ser-Tyr-X₆-X₇-X₈-X₉-Cys (SEQ ID NO:17), wherein

| _____ |

X₃ is Asn or Asp;

X₆ is Gly or Tyr;

X₇ is His or Val;

X₈ is Pro or Trp; and

X₉ is Trp or Tyr;

wherein said fibrin binding polypeptide has the ability to bind fibrin.

53. (New) The isolated, non-naturally occurring fibrin binding polypeptide according to claim 52, comprising the amino acid sequence

X₁-X₂-X₃-Cys-Tyr-X₆-Ser-Tyr-X₉-X₁₀-X₁₁-X₁₂-Cys-X₁₄-X₁₅-X₁₆ (SEQ ID NO:65),
| _____ |

X₁ is Asn or Arg;

X₂ is His or Phe;

X₃ is Gly or Leu;

X₆ is Asn or Asp;

X₉ is Gly or Tyr;

X₁₀ is Val or His;
X₁₁ is Pro or Trp;
X₁₂ is Tyr or Trp;
X₁₄ is Asp or Ser;
X₁₅ is Tyr or His; and
X₁₆ is Ser or His.

54. (New) An isolated, non-naturally occurring fibrin binding polypeptide comprising:

a polypeptide comprising a cyclic peptide having the amino acid sequence
Cys-Pro-Tyr-X_{aa}-Leu-Cys (SEQ ID NO:20), wherein

| _____ |

X_{aa} is Asp, Gly or Ala, and wherein said fibrin binding polypeptide has the ability to bind fibrin.

55. (New) The isolated, non-naturally occurring fibrin binding polypeptide according to claim 54, wherein said cyclic peptide has the amino acid sequence
X₁-X₂-Cys-Pro-Tyr-X₆-Leu-Cys-X₉-X₁₀-X₁₁ (SEQ ID NO:66), wherein

| _____ |

X₁ is Trp, Phe, His or Tyr;
X₂ is His, Asp or Glu;
X₆ is Asp, Gly or Ala;
X₉ is His, Phe, Tyr or Trp;
X₁₀ is Ile, Leu, or Val; and
X₁₁ is Asn, Gln, Ile, Leu or Val.

56. (New) The isolated, non-naturally occurring fibrin binding polypeptide according to claim 49, said cyclic peptide having an amino acid sequence selected from the group consisting of:

Arg-Ser-Cys-Asn-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:5);
|_____|

His-Asp-Cys-Gln-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:6);
|_____|

Phe-Ala-Cys-His-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:7);
|_____|

Arg-Pro-Cys-Asp-Tyr-Tyr-Gly-Thr-Cys-Phe-Asp (SEQ ID NO:8);
|_____|

Leu-Pro-Cys-Asp-Tyr-Tyr-Gly-Thr-Cys-Leu-Asp (SEQ ID NO:9);
|_____|

Phe-Ser-Cys-Trp-Tyr-Ser-Leu-His-Cys-His-Arg (SEQ ID NO:10);
|_____|

Asp-Pro-Cys-Ser-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:11);
|_____|

Leu-Pro-Cys-Ser-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:12);
|_____|

Leu-Ser-Cys-Asp-Tyr-Tyr-Gly-Thr-Cys-Leu-Arg (SEQ ID NO:13);
|_____|

Leu-Ala-Cys-His-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:14);
|_____|

Asp-Gly-Cys-His-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:15);
|_____|

Arg-Pro-Cys-Asn-Tyr-Tyr-Gly-Thr-Cys-Leu-His (SEQ ID NO:16);
|_____|

Pro-Cys-Asp-Tyr-Tyr-Gly-Thr-Cys-Leu (SEQ ID NO:32);
|_____|

Cys-Asp-Tyr-Tyr-Gly-Thr-Cys-Leu (SEQ ID NO:33);
|_____|

Cys-Asp-Tyr-Tyr-Gly-Thr-Cys (SEQ ID NO:34);

|_____|

Leu-Pro-Cys-Asp-Tyr-Tyr-DAla-Thr-Cys-Leu-Asp (SEQ ID NO:40);

|_____|

Leu-Ala-Cys-Asp-Tyr-Tyr-Gly-Thr-Cys-Leu-Asp (SEQ ID NO:41);

|_____|

Leu-Pro-Cys-Ala-Tyr-Tyr-Gly-Thr-Cys-Leu-Asp (SEQ ID NO:42);

|_____|

Leu-Pro-Cys-Asp-Ala-Tyr-Gly-Thr-Cys-Leu-Asp (SEQ ID NO:43);

|_____|

Leu-Pro-Cys-Asp-Tyr-Tyr-Ala-Thr-Cys-Leu-Asp (SEQ ID NO:45);

|_____|

Leu-Pro-Cys-Asp-Tyr-Tyr-Gly-Ala-Cys-Leu-Asp (SEQ ID NO:46);

|_____|

Leu-Pro-Cys-Asp-Tyr-Tyr-Gly-Thr-Cys-Ala-Asp (SEQ ID NO:47);

|_____|

Leu-Pro-Cys-Asp-Tyr-Tyr-Gly-Ser-Cys-Leu-Asp (SEQ ID NO:48); and

|_____|

Leu-Pro-Cys-Asp-Tyr-Tyr-Gly-Val-Cys-Ala-Asp (SEQ ID NO:51).

|_____|

57. (New) The isolated, non-naturally occurring fibrin binding polypeptide according to claim 54, said cyclic peptide having an amino acid sequence selected from the group consisting of:

Trp-Phe-His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile-Leu (SEQ ID NO:21);

|_____|

Gln-Trp-Glu-Cys-Pro-Tyr-Gly-Leu-Cys-Trp-Ile-Gln (SEQ ID NO:22);

|_____|

Gly-Phe-His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile-Leu (SEQ ID NO:23);

|_____|

Phe-His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile-Leu (SEQ ID NO:24);

|_____|

His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile-Leu (SEQ ID NO:25);

|_____|

Phe-His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile (SEQ ID NO:26);

|_____|

Trp-Glu-Cys-Pro-Tyr-Gly-Leu-Cys-Trp-Ile-Gln (SEQ ID NO:27);

|_____|

Glu-Cys-Pro-Tyr-Gly-Leu-Cys-Trp-Ile-Gln (SEQ ID NO:28);

|_____|

Trp-Glu-Cys-Pro-Tyr-Gly-Leu-Cys-Trp-Ile (SEQ ID NO:29);

|_____|

Gly-Phe-His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile-Leu (SEQ ID NO:57);

|_____|

Phe-His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile-Leu (SEQ ID NO:58);

|_____|

His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile-Leu (SEQ ID NO:59);

|_____|

Phe-His-Cys-Pro-Tyr-Asp-Leu-Cys-His-Ile (SEQ ID NO:60);

|_____|

Trp-Glu-Cys-Pro-Tyr-Gly-Leu-Cys-Trp-Ile-Gln (SEQ ID NO:61);

|_____|

Glu-Cys-Pro-Tyr-Gly-Leu-Cys-Trp-Ile-Gln (SEQ ID NO:62); and

|_____|

Trp-Glu-Cys-Pro-Tyr-Gly-Leu-Cys-Trp-Ile (SEQ ID NO:63).

|_____|

58. (New) The isolated, non-naturally occurring fibrin binding polypeptide according to claim 52, said cyclic peptide having an amino acid sequence selected from the group consisting of:

Asn-His-Gly-Cys-Tyr-Asn-Ser-Tyr-Gly-Val-Pro-Tyr-Cys-Asp-Tyr-Ser (SEQ ID NO:18);

and

Arg-Phe-Leu-Cys-Tyr-Asp-Ser-Tyr-Tyr-His-Thp-Trp-Cys-Ser-His-His (SEQ ID NO:19).

59. (New) An isolated, non-naturally occurring fibrin binding polypeptide according to any one of claims 49 to 58, wherein said polypeptide selectively binds fibrin but not fibrinogen.

60. (New) An isolated, non-naturally occurring fibrin binding polypeptide according to claim 59, wherein said polypeptide has a K_d for fibrinogen which is at least 1.5 greater than its K_d for fibrin.

61. (New) An isolated, non-naturally occurring fibrin binding polypeptide according to claim 60, wherein said polypeptide has a K_d for fibrinogen which is at least 10 greater than its K_d for fibrin.

62. (New) An isolated, non-naturally occurring fibrin binding polypeptide according to claim 61, wherein said polypeptide has a K_d for fibrinogen which is at least 100 greater than its K_d for fibrin.

63. (New) An isolated, non-naturally occurring fibrin binding polypeptide according to claim 62, wherein said polypeptide has a K_d for fibrinogen which is at least 1000 greater than its K_d for fibrin.

64. (New) A cyclic compound having the ability to bind fibrin and having the formula selected from the group consisting of (I), (II), (III) and (IV):

